



UNITED STATES PATENT AND TRADEMARK OFFICE

en

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,656	05/05/2005	Bjorn A Fossum	05059	1379
23338	7590	12/15/2006		EXAMINER
DENNISON, SCHULTZ & MACDONALD 1727 KING STREET SUITE 105 ALEXANDRIA, VA 22314				CHEN, SHELLEY
			ART UNIT	PAPER NUMBER
			3662	

DATE MAILED: 12/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/533,656	FOSSUM, BJORN A
	Examiner Shelley Chen	Art Unit 3662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 05 May 2005.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-13 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-7, 10-12 is/are rejected.
 7) Claim(s) 8,9 and 13 is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 05 May 2005 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 19 August 2005.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application
 6) Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

2. The disclosure is objected to because of the following informalities: The headings for the Brief Description of the Drawings and Detailed Description of the Invention sections are missing.

Appropriate correction is required.

Drawings

3. The drawings are objected to because the unlabeled rectangular box(es) should be provided with descriptive text labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be

Art Unit: 3662

removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 2 objected to because of the following informalities: The limitation "this" in the phrase "this is used for determining the distance and relative velocity..." does not explicitly state that "this" refers to the beat frequencies and Doppler frequencies for each transponder in the previous step of the method.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 11-13 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 11-13, as written, are classified as indefinite. MPEP 2173.05 (f), states a single claim, which claims both an apparatus and the method steps of using the apparatus, is indefinite under USC 112, second paragraph. This type of claim is indefinite because it fails to positively recite the boundaries of protection. The metes and bounds of the claim cannot be determined because it is unclear whether protection is sought for the method or for the apparatus.

The examiner will assume that claims 11-13 comprise a system capable of carrying out the method as claimed in claim 1. As best understood by the examiner, claims 11-13 will be treated on the merits in this office action.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. **Claims 1, 11, and 12 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Decca Ltd.** (GB Patent # 1313928) in view of **Pidwerbetsky et al.** (U.S. Patent #6,084,530).

Regarding claims 1 and 11, Decca discloses all of the limitations of the instant invention except for the transponder(s) that generate different sideband frequencies to introduce an identity tag into the signal to be reflected to the interrogator. See the abstract (relative position between objects in a marine environment, maneuverability, interrogator sends radio signal to transponder, attitude determination), page 1 lines 19-47 (attitude determination/correction), and page 3 lines 58-65 (FMCW). Decca discloses that the transponder may radiate a coded response (page 3 lines 127-129), that does not necessarily represent an identity tag.

In the same field of endeavor, Pidwerbetsky discloses a modulated backscatter sensor system that, " includes an Interrogator for generating and transmitting a radio signal. One or more Tags contained within the radio communication system receive the radio signal. A Backscatter Modulator modulates the reflection of the radio signal using

a subcarrier signal, thereby forming a reflected modulated signal. The Interrogator receives and demodulates the reflected modulated signal. Based upon the characteristics of the demodulated signal, the Interrogator can determine the identity of the Tag, and the relative velocity of the Tag with respect to the Interrogator." (abstract) As shown in figures 3 and 6, the transponder(s) introduce identifying sideband frequencies by modulating the signal received from the interrogator with a subcarrier of frequency f_s . See also figures 1 and 2 (processors). Thus Pidwerbetsky teaches all of the additional limitations introduced by claims 1 and 11.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Decca's transponder to generate different sideband frequencies to introduce an identity tag into the signal to be reflected to the interrogator, as taught by Pidwerbetsky.

Doing so would allow the interrogator to identify the transponders by their subcarrier frequencies, as suggested by Pidwerbetsky in the abstract.

Regarding claim 12 as applied to claim 11 above, Decca fails to disclose if the interrogator is implemented with non-moving parts. However, Pidwerbetsky discloses that the interrogator is implemented with non-moving parts. Pidwerbetsky achieves directionality with non-moving parts by implementing multiple interrogators linked to a common application processor, as shown in figure 1. Thus Pidwerbetsky teaches all of the additional limitations introduced by claim 12.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Decca's interrogator to use non-moving parts, as taught by Pidwerbetsky.

Doing so would improve the reliability of the interrogator and require less maintenance for the system.

See also Baghdady (U.S. Patent # 4,203,113) regarding the claims above, particularly column 1 lines 12-18 (basics), column 3 lines 4-9 (transponder), and column 14 lines 7-26 (list of common applications, including those in marine environments).

10. Claims 2-6 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Decca Ltd. (GB Patent # 1313928) in view of Pidwerbetsky et al. (U.S. Patent #6,084,530) as applied to claims 1 and 11 above, and further in view of Baghdady (U.S. Patent # 4,203,113).

Regarding claim 2 as applied to claim 1 above, Decca's invention, as modified by Pidwerbetsky, discloses all of the limitations of the instant invention except that the distance between each integrator and transponder is not determined from the beat frequencies from each transponder. See figure 4 (transponder on object to be positioned), figures 3/6 (transponder modulates an identifier frequency into the signal to be sent back to the interrogator), column 10 lines 25-58 (transponder signals received

by series of antenna elements on the interrogator(s), and combined signals used to determine angles to the transponders/angles of transponder motion in process that is functionally equivalent to the two-planes method), and column 5 lines 18-28 (determine relative velocity from Doppler frequencies derived from transponder signals)

In the same field of endeavor, Baghdady discloses a radar system as discussed in the Background of the Invention section. Baghdady also derives beat and Doppler frequencies to determine the ranges and velocities between interrogators and targets. (column 11 lines 49-62) See also column 1 lines 26-37 (directional radar antenna systems). Thus Baghdady teaches all of the additional limitations introduced by claim 2.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Decca's interrogator to compute ranges from beat frequencies, as taught by Baghdady.

Doing so would allow the interrogator to compute ranges using a relatively simple and cost-effective system, as discussed by Baghdady in column 1 line 41 to column 2 line 18.

Regarding claim 3 and 5 as applied to claim 2 above, Decca fails to disclose the presence of an additional transponder. However, Pidwerbetsky discloses additional transponders (figure 1) and further implies that the interrogator(s) simultaneously illuminate all transponders, "Interrogator can regularly transmit interrogation messages, addressed to all Tags in the RF field, requesting those Tags to respond with their

identification number." (column 8 lines 38-41) Thus Pidwerbetsky teaches all of the additional limitations introduced by claims 3 and 5.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Decca's interrogator to illuminate multiple transponders simultaneously, as taught by Baghdady.

Doing so would permit the interrogator to be positioned more precisely and reliably and with less ambiguity by the use of multiple range and velocity measurements, or permit centralized tracking of the entire system if it is the transponders being positioned.

Regarding claim 4 as applied to claim 2 above, Decca further discloses that the interrogator is operated autonomously towards any transponder, as discussed at the beginning of the abstract and on page 1 lines 9-12.

Regarding claim 6 as applied to claim 2 above, Decca further discloses combining distance and angle measurements to position the vehicle/vessel, as discussed in the abstract. This is equivalent to combining the distance and angle measurements in two planes. Decca discloses that the vessel uses the interrogator, not the transponder, but it would be obvious to one skilled in the art at the time of the invention to switch the interrogators and transponders so that the mobile vessel uses the transponder, as taught by Pidwerbetsky and many others. Doing so would allow a central processor to track and monitor all transponders at once, and would also allow

many vehicles to join the system cheaply with the addition of a transponder rather than an interrogator.

Regarding claim 10 as applied to claim 2 above, Decca further discloses that all of the limitations of the instant invention, as discussed on page 1 line 86 to page 2 line 5 (vessel is interrogator, platform is transponder)

See also **Baghdady** (U.S. Patent # 4,060.809) regarding claims 1 and 6 above, particularly figures 1 and 4 (combining distance and angle information for positioning), column 12 line 51 to column 13 line 47 (attitude determination), column 11 lines 28-50 (more attitude determination, fixed ground coordinate system).

11. **Claim 7 rejected** under 35 U.S.C. 103(a) as being unpatentable over **Decca Ltd.** (GB Patent # 1313928) in view of **Baghdady** (U.S. Patent # 4,203,113) as applied to claim 2 above, and further in view of **Baghdady** (U.S. Patent # 4,060,809).

Regarding claim 7 as applied to claim 2 above, Decca's invention, as further modified by Pidwerbetsky, clearly shows and discloses all of the limitations of the instant invention except that range, angles, and attitude are not combined to determine the absolute position of transponders and interrogators.

In the same field of endeavor, Baghdady discloses a tracking and positioning radar system using IDFM with target-borne transponders. Figures 1, 3, and 4 show the combination of range, angles, and attitude to determine the absolute position of transponders. The interrogators are ground-based stations at known, fixed locations (column 11 lines 37-39) Thus Baghdady teaches all of the additional limitations introduced by claim 7.

Therefore, it would have been obvious to one skilled in the art at the time of the invention to modify Decca's radar system to combine range, angles, and attitude to determine the absolute position of transponders and interrogators, as taught by Baghdady.

Doing so would facilitate the navigation of the transponder to a target of approximately known location that is not currently visible to the transponder.

Allowable Subject Matter

12. **Claims 8-9 and 13** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited as disclosing limitations of the applicant's claimed and disclosed inventions: Johnson, Isaji, Naktani, Zidek, Tomasi.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelley Chen whose telephone number is (571) 270-1330. The examiner can normally be reached Mondays through Thursdays and on alternate Fridays, between 9:00 AM and 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell McKinnon can be reached at (571) 272-4797. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shelley Chen,

Shelley Chen

Patent Examiner

Art Unit 3662

December 7, 2006

Terrell L. McKinnon
TERRELL L. MCKINNON
SUPERVISORY PATENT EXAMINER